

REMARKS

Reexamination and reconsideration of the rejections of the pending claims are hereby requested.

Claims 1-20 stand rejected under 35 USC § 112, 2nd Paragraph, as being indefinite for failing to particularly point out distinctly claim the subject matter which applicant regards as the invention. In response to this rejection, Claims 1, 5, 6, 7, 8, 9, 10, 17, 18, 19 and 20 have been amended to remedy the lack of a proper antecedent basis. The examiner has indicated that Claims 1-20, if amended to overcome the 35 USC § 112, 2nd Paragraph, rejection relating to lack of proper antecedent basis, would be allowable. Now that these claims have been amended, it is submitted that they are in condition for allowance. Reconsideration is requested.

Independent Claim 21 stands rejected under 35 USC § 102(b) as being anticipated by Jacala *et. al.*, US Patent No. 5,536,143. It is requested that this rejection be reconsidered in view of the following discussion.

Claim 21 is directed to a gas turbine engine having gas turbine engine components assembled into sets. Each of the components has flow passages establishing a flow capability classification and each component in a set has the same flow capability classification.

As discussed in the application, gas turbine engine components such as blades or vanes often include internal passages through which air flows to cool the component. The cooling air flow through each individual component is driven by the pressure ratio across the element. As explained in the application, individual turbine blades are subject to manufacturing variation. This variation comes from a variety of sources such as casting and film hole geometric variability. As a result, each manufactured turbine blade exhibits a slightly different relationship between mass flow and pressure ratio. That is, for a given mass flow of cooling air an individual turbine blade would operate at a different pressure ratio because of the inevitable manufacturing variations.

By classifying blades into categories such as low-flow and high-flow blades, blades of a single classification can be assembled into sets. In this way, the lowest flow capability blade of the set (within the single classification) will have greater cooling air flow than would be the case if the set were assembled from a mixture of high and low-flow blades.

The examiner states that the limitation “flow capability classification” is not given patentable weight. The examiner states that it is assumed that every gas turbine engine component of the same purpose has the same flow capability. This assertion is incorrect. As discussed above, it is impossible in practice to make blades or other engine components with exactly the same flow characteristics. The applicants of the present application recognized that manufacturing variation will inevitably lead to different flow characteristics. The point of the present invention is to assemble sets in which the blades fall into the same flow capability classification, thus assuring that the lowest flow blade within that classification category will carry more cooling air than would otherwise be the case.

The examiner has rejected Claim 21 as anticipated *Jacala et. al.* This patent relates to turbine blades including serpentine internal passages through which steam, rather than air, is circulated. There is no teaching whatsoever of classifying blades in a blade set according to flow capability through flow passages. Further, there is no recognition that flow capability will necessarily vary from one blade to the next. The examiner refers to figures 3 and 6 and states that each component has flow passages “establishing a flow capability classification, wherein each said component in a set has the same flow capability classification.” The undersigned has reviewed the *Jacala et. al.* patent very carefully and can find no disclosure or recognition relating to flow capability classification. The examiner goes on to note that the limitation of flow capability classification is not given patentable weight “because it is assumed that in every gas turbine engine each component of the same purpose, such as a blade, or vane, or seal, has the same flow capability.” As made entirely clear in the present application, “components of the same purpose” do not have the same flow capability because of real-world manufacturing limitations.

As discussed in the specification, individual blades according to the invention are classified according to their actual flow capability. For example, blades may be classified as low-flow or high-flow and blades in one of these classifications are used to form a blade set. There is no such teaching in the cited reference.

For the foregoing reasons, it is submitted that all of the pending claims are now in condition for allowance and early favorable action is requested.

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Respectfully submitted,


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